



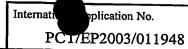
INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 10 520	FOR FURTHER A	Preliminary	cation of Transmittal of International Examination Report (Form PCT/IPEA/416)				
International application No. PCT/EP2003/011948	International filing d	ate (day/month/year) 03 (28.10.2003)	Priority date (day/month/year)				
International Patent Classification (IPC) or n C07C 5/333, 11/06			31 October 2002 (31.10.2002)				
Applicant	UHDE	GMBH					
1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of							
Date of submission of the demand Date of completion of this report							
18 May 2004 (18.05.2004)		Date of completion of this report 28 June 2004 (28.06.2004)					
Name and mailing address of the IPEA/EP		Authorized officer					
Facsimile No.		Telephone No.					

Form PCT/IPEA/409 (cover sheet) (July 1998)





I.	Basis	of the r	eport	
ī	. With	regard to	the elements of the international application:*	
l		the inte	mational application as originally filed	
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		pages	1-8	or originally filed
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		pages pages	1-9	, as originally filed
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		pages	1/2-2/2	, as originally filed
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		the seque	nce listing part of the description:	
		pages		as originally filed
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2.		e element the lang the lang	guage of a translation furnished for the purposes of international search (under Rule 23.1 guage of publication of the international application (under Rule 48.3(b)). guage of the translation furnished for the purposes of international preliminary examinations.	which is: (b)).
3.	With preli	contain	to any nucleotide and/or amino acid sequence disclosed in the international a camination was carried out on the basis of the sequence listing: ed in the international application in written form.	pplication, the international
	H		ed subsequently to this Authority in written form.	
	H		ed subsequently to this Authority in computer readable form.	
		micinal	atement that the subsequently furnished written sequence listing does not go be ional application as filed has been furnished.	
	Ш	The sta	tement that the information recorded in computer readable form is identical to the mished.	written sequence listing has
4.			endments have resulted in the cancellation of: he description, pages he claims, Nos he drawings, sheets/fig	
5.		This reposed to	ort has been established as if (some of) the amendments had not been made, since they he disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**	have been considered to go
	Repla in thi and 7	o . opo	heets which have been furnished to the receiving Office in response to an invitation und as "originally filed" and are not annexed to this report since they do not contac	ler Article 14 are referred to in amendments (Rule 70.16
		•	nt sheet containing such amendments must be referred to under item 1 and annexed to th	is raport
			and annexed to the	ы герогі.

v.	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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Statement			
Novelty (N)	Claims	1-9	YES
	Claims		NO
Inventive step (IS)	Claims	1-9	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-9	YES
	Claims		NO

2. Citations and explanations

The present application relates to a method for producing unsaturated hydrocarbons,

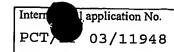
wherein, in a first step, a hydrocarbon, particularly a mixture containing alkanes, which can contain water vapor and essentially does not contain oxygen, is fed through a first catalyst bed in a continuous process, said catalyst bed having the usual dehydrating conditions,

liquid water as well as water vapor and an oxygencontaining gas are then added to the reaction mixture obtained in the first step, and

in a second step, the reaction mixture so obtained is fed through a second catalyst bed in a continuous process in order to oxidize the hydrogen and to further dehydrate the hydrocarbons.

Document US-A-4 599 471 (D1) represents the closest prior art and differs from the present application in that the reaction mixture obtained in the first step does not have water added to it for cooling in the liquid phase.

The objective technical problem is thus seen to be that of providing an improved method for producing unsaturated hydrocarbons. The solution is described in claim 1 and relates to cooling with water in the liquid phase.



According to document D1, the cooling is accomplished either indirectly by means of a heat exchanger or directly. In the second embodiment, a gas or a liquid is added to the stream to be cooled. The use of water in the liquid phase is not described. The third embodiment that can be found in D1 is a combination of indirect cooling and direct cooling, with water in the liquid phase being vaporized by the heat exchanger and the water vapor being admixed to the medium to be cooled (cf. column 6, lines 29-56).

Proceeding from document D1, it is not obvious to a person skilled in the art to consider using water in the liquid phase to cool the reaction mixture obtained from the first step. Not only is this simplified form of cooling more cost-effective in terms of equipment but selectivity to the corresponding end products is also increased, since it is possible to prevent overheating in the catalyst bed.

Therefore, the subject matter of claims 1-9 fulfills the criteria of PCT Article 33(2) and (3).